



Via Electronic Submission

September 13, 2013

Mr. Doug Anderson
ENERGY STAR Home Improvement Program
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460-0001

Subject: - ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights –
Version 6.0 Final Draft Eligibility Criteria

Dear Mr. Anderson:

The Window and Door Manufacturers Association (WDMA) appreciates the opportunity to comment on EPA's ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 6.0 Final Draft Eligibility Criteria. WDMA members have long been committed supporters of the ENERGY STAR program and have contributed substantially in growing the ENERGY STAR brand in the window, door and skylight sector because of the great benefit it has been to consumers and energy savings.

In developing these comments, we have carefully reviewed the changes made to the Final Draft Eligibility Criteria, as well as the supporting background material. We greatly appreciate the effort the Agency has made to date in developing Version 6.0, and many of the changes that EPA has made in Final Draft, specifically:

- extending the implementation date to January 1, 2015;
- raising the North-Central Zone window criteria from ≤ 0.29 to ≤ 0.30 ;
- allowing WDMA Hallmark Certification and labeling to indicate compliance with the proposed air infiltration requirements; and,
- providing more flexibility with the installation instruction requirements.

We believe these changes are significant improvements that address critical concerns raised by WDMA and other stakeholders. In particular, EPA's decision to set a later implementation date provides more practical lead time necessary for implementing the revised specifications, and EPA's decision to raise the U-factor in North-Central Zone recognizes the importance of setting criteria that ensures that ENERGY STAR qualified products are cost-effective, affordable, and sufficiently available.

At the same time, we continue to have significant concerns with certain aspects of EPA's process for developing revisions to the Version 6.0 specification, as well as with several key elements of the proposed Final Draft eligibility criteria. Our remaining concerns include:

- EPA's extensive reliance on information that is not contained in the public record;
- EPA's proposed revisions to Version 6.0 window specifications in the Northern and South-Central Zones, as well as EPA's original and revised payback analysis, including its view that payback "within the life of the product" is reasonable, and its product availability analysis;

- EPA’s proposed revisions to Version 6.0 skylights specifications in the Northern, North-Central and South-Central Zones; and,
- EPA’s inadequate response to concerns regarding energy savings and payback periods for doors under the proposed specifications.

Section 1 provides details on our ongoing concerns regarding the transparency of EPA’s process for establishing the Version 6.0 revision. Section 2 summarizes our comments on the windows specification, and Section 3 addresses our comments on the skylight specification.

Section 1: WDMA’s General Concerns Regarding Transparency

During the Draft 2 public comment process, WDMA raised significant concerns regarding the transparency of EPA’s public stakeholder process. After reviewing EPA’s responses to WDMA’s input on Draft 2, as well as the additional information provided with the Final Draft specification, our concerns have not lessened. Our review of EPA’s Response to Comment (RTC) documents reveals that on many technical and analytical issues EPA has given significantly greater weight, in a number of critical decisions, to information provided by manufacturers and other stakeholders outside of the public comment process, and more cursory responses to input offered through the public comment process. In addition, we do not believe that the Agency has provided an adequate explanation of its reasoning on key issues, and we are concerned that the Agency too frequently relies on general statements rather than specific information when responding to stakeholder input.

We recognize and greatly appreciate that EPA has released additional data with the Final Draft revisions. However, much of this information is very general in nature and does not fully address our key areas of concern. At this point, because of EPA’s approach to obtaining and handling data, as well as the content of many of their responses to public stakeholder comments, we believe the public record for the Version 6.0 revision is incomplete. This issue is important because stakeholders cannot effectively evaluate EPA’s decisions if key information is not made available to them.

WDMA also recognizes that ENERGY STAR is not a regulatory program, and we understand the challenges in obtaining, discussing, and disclosing cost and technology data obtained from industry stakeholders and others. However, this situation does not justify EPA’s undue reliance on confidential information or the Agency’s unwillingness to explain how it has used information received outside of the public comment process. EPA should at the very least provide stakeholders with clear descriptions of the information it has obtained and how it has used the information in its decision making. We believe this can be done while appropriately protecting confidentiality.

We believe that EPA should be much more transparent and substantive in its replies to the comments submitted by stakeholders. Specifically, we recommend the following:

- First, when stakeholders submit alternative analyses, EPA should provide its specific views on that analysis. In many cases, EPA has failed to fully engage in the substance of stakeholder comments, instead responding with general statements of limited relevance. In Comment 70 of

the RTC on Windows, for example, WDMA provided explicit analysis regarding product availability in the Northern Zone, which was only casually acknowledged by EPA in its response.¹

- Second, additional data submitted by stakeholders through the public process should not be dismissed as “insufficient” without an explanation of the identified deficiencies. The Agency should explain how it weighed the validity of data and why it concluded that particular data was not acceptable. Such an approach would be more useful for both stakeholders and the Agency because stakeholders would understand EPA’s evaluation criteria and on that basis could provide more meaningful data. Failure to provide transparent explanations creates the impression that the Agency is overly reliant on information obtained outside the public process and dismissive of data submitted in public comments.
- Third, when stakeholders ask for additional information on EPA analyses, the Agency should provide more than a general description of general approach and sources used; EPA should explain how the available data supports the Agency’s conclusions. For example, stakeholders know that EPA used the NFRC Certified Product Directory (CPD) and Products Available for Sale databases to assess product availability. What EPA has not explained is how it concluded that there would be sufficient availability of qualifying windows in the Northern Zone based on these databases. Despite repeated requests, EPA has still not answered this question. As another example provided below, EPA responded to a request for a more detailed explanation on its product availability assessments with a very general summary of its process, and no discussion of the actual information or analysis upon which the Agency’s conclusions were based:

Comment (as summarized by EPA): One commenter believes that EPA has not demonstrated adequate product availability based on either the CPD analysis or the products available for sale analysis.

EPA Response: EPA used both the CPD and the Products Available for Sale Database when performing its analyses. These two analyses helped EPA evaluate potential availability for various specification levels at the time the Version 6.0 criteria take effect, which is the primary concern with respect to availability when revising a specification. The analyses of both the CPD and the Products Available for Sale Database indicate there will be adequate product availability when the proposed specification takes effect with the revised implementation date of January 1, 2015. In addition to analyzing these two databases, EPA reviewed and discussed product availability with product manufacturers to confirm that products would be available.²

Our recommendations are intended to help EPA improve transparency and provide more credible justifications for their decisions. These objectives can only be achieved when it is clear that EPA is taking public input as seriously as their stakeholders. The current weaknesses in EPA’s stakeholder process are significant and should be addressed.

¹ US EPA, *Response to Comments on Draft 2 Windows Criteria*, Comment #70, p. 24-25.

² *Response to Comments on Draft 2 Windows Criteria*, Comment 68, p. 24.

Section 2: WDMA concerns on the proposed windows specifications

In Version 6, Draft 2 comments, WDMA urged EPA to modify the proposed window specifications in the Northern and North-Central Zones to address concerns regarding product availability, the cost-effectiveness analysis, affordability and lengthy payback periods, and a lack of transparency in the underlying dataset. EPA's recently released Final Draft proposes to retain the Northern Zone specification, raises the specifications in the North-Central Zone, and (unexpectedly) lowers the South-Central Zone specification. While we appreciate the Agency's decision in the North-Central Zone, we still have significant remaining concerns regarding the Northern Zone, and believe EPA's rationale for increasing stringency in the South-Central Zone should have been more data driven than subjective.

The discussion below provides our feedback on EPA's Final Draft proposal for windows. We focus on four issues: (1) EPA's inconsistent approach in revising the specifications in different climate zones; (2) our concerns regarding EPA's original and revised payback analysis; (3) EPA's view of "reasonable" payback periods; and, (5) product availability in the Northern Zone.

2.1 Concerns regarding retention of the Northern Zone U-factor, revision of South-Central Zone U-factor, and appreciation of revisions in the North-Central Zone

EPA received many public comments on the proposed Version 6, Draft 2 specifications in the Northern, North-Central, and South-Central Zones. The Agency responded to these concerns by retaining the U-factor in the Northern Zone, raising the U-factor in the North-Central Zone, and lowering the U-factor in the South-Central Zone. WDMA appreciates EPA's well-reasoned revision of the North-Central Zone U-factor, but finds EPA's justification for the decision to retain the Northern U-factor and reduce the South-Central U-factor questionable. Based on our review, these decisions appear inconsistent across climate zones, lacking sufficient analytical support in the North and South-Central zones, and, in several instances, are overly reliant on confidential information.

2.1.1 EPA should have raised the Northern Zone U-factor to 0.29 or higher

EPA received a range of public input on the Northern Zone specification. Four commenters asked EPA to lower the U-factor to 0.25 (or, in one case, 0.24); five commenters asked EPA to raise the U-factor, with three supporting 0.28 and two supporting 0.29; and two commenters did not weigh in on EPA's proposed level of 0.27, but requested additional energy-equivalent trade-offs. Based on this input, EPA decided to stick with a U-factor of 0.27. EPA has justified this decision based on a revised cost-effectiveness analysis developed in response to stakeholder critique of its original approach.³ Because all of the Draft 2 public input on the original payback analysis for windows focused on EPA's *underestimation* of the cost of achieving the proposed specifications, we were expecting the Agency to address our specific concerns by revising the original cost assumptions upward. Instead, EPA's response to stakeholder input was to dramatically *lower* its cost assumptions. The Agency's decision to develop a revised analysis, and its reliance on those results to justify retaining the Northern Zone U-factor was surprising.

³ US EPA, *Review of Cost Effectiveness Analysis*, and USEPA, *Version 6.0 Draft 1 Criteria and Analysis Report*, July 2012.

We also find that EPA's responses to public input on the Northern Zone specification are overly general. The Agency did not provide specific responses to public comments provided by several stakeholders regarding the need to raise Northern Zone U-factor. Instead, EPA justified its decision with general statements and confidential discussions, stating:

"EPA specifically chose a criteria level for the Northern Zone that would ensure that triple-pane windows are not required to meet the proposed specification and that there are multiple pathways for double-pane windows to qualify. Analysis of the CPD and Products Available for Sale Database indicates that double-pane windows can meet the proposed specification. Cost data from manufacturers indicate that it is possible to manufacture cost-effective double-pane windows that meet the proposed specification. Conversations with manufacturers confirm that this is the case."⁴

Each of EPA's statements in this response is an assertion without specific support. First, EPA's claim that the proposed criteria has been specifically set to "ensure" that triple-pane product will not be required, appears unreasonable given that almost 70% of the cost-estimates submitted in 2011 for the Northern Zone were for triple-pane windows.⁵ EPA excluded all of these data points in both the original and revised payback analyses because it considers triple-pane windows too expensive to offer a reasonable payback.⁶ The Agency has not explained how it knows that triple-pane windows will not be needed in many cases to meet the Version 6 specifications.

Second, EPA has never explained how the CPD and Products Available for Sale databases support its conclusion that the supply of double-pane windows will be sufficient. In Draft 2 comments, WDMA provided specific reasons supporting our conclusion that adequate supply of qualifying double-pane windows is not guaranteed in the Northern Zone. In response, EPA has simply asserted that double-panes can meet the proposed specification.

Third, EPA has not provided information to support the statement that "cost data from manufacturers indicate that it is possible to cost-effectively manufacture double-pane windows."

And finally, EPA states "conversations with manufacturers confirm [EPA's position]" while providing little explanation, even of what could be disclosed.

Given the weaknesses in EPA's rationale, especially the lack of transparency regarding the basis of EPA's decision, WDMA believes that EPA has not properly justified maintaining the Northern Zone maximum U-factor specification at 0.27. We therefore reiterate our request that the Northern Zone U-factor be raised to 0.29 or higher.

2.1.2 WDMA does not support EPA's decision to lower the South-Central Zone U-factor to 0.30

EPA's rationale for lowering the proposed U-factor from 0.31 to 0.30 in the South-Central Zone is also not substantiated. In this case, three Draft 2 commenters asked EPA to raise the specification to 0.32,

⁴ *Response to Comments on Draft 2 Windows Criteria*, Comment 47, p. 17. -

⁵ US EPA, *Characterization of Windows Cost Data provided by Manufacturers*, August 22, 2013, table on p. 2. -

⁶ *Draft 1 Report*, p. 27. -

citing concerns over long payback periods. No stakeholder provided public comment supporting a lower U-factor. Nevertheless, EPA proposed lowering the proposed specification in the Final Draft, explaining:

“EPA has modified the South-Central Zone U-factor to 0.30 based on conversations with manufacturers. EPA notes that commenters did not provide specific information explaining their rationale for requesting a U-factor of 0.32. The proposed U-factor maximum of 0.30 in the South-Central Zone will simplify the proposed specification and make up some of the lost energy savings resulting from the increase in the North-Central Zone U-factor from 0.29 to 0.30. In addition, windows with U-factors of 0.30 are widely available due to the expired “30/30” Federal tax credit.”⁷

This rationale raises several concerns. First, it is clear that EPA relied largely on confidential information provided by stakeholders. As previously stated we understand that EPA needs to protect confidentiality, but this should not allow EPA to avoid explaining how it used the available information in reaching its decisions.

Second, EPA dismissed public input supporting a higher U-factor in the South-Central Zone because stakeholders did not provide “*specific information explaining their rationale.*” This statement does not appear to be accurate; stakeholders did provide comment on long payback periods in the Southern Zone, which EPA has not appropriately responded to. As in the Northern Zone, it appears EPA is using the newly revised payback analysis to support a lower U-factor. This seems unreasonable, however, since no stakeholders provided input that requested or supported the lower cost assumptions developed for the new analysis.

For these reasons, WDMA does not support EPA’s decision to lower the South-Central Zone U-factor. While we did not comment specifically on the South-Central Zone U-factor in Draft 2, we find EPA’s decision to reduce the U-factor based on confidential input inconsistent with the public record.

2.1.3 WDMA appreciates EPA’s decision to raise the North-Central Zone specification

In the North-Central Zone, EPA received comments from four stakeholders supporting an upward revision of the Draft 2 proposed specification. EPA did not receive any comments recommending that it be lowered. In this case, EPA acted on public input and provided a compelling rationale for its decision:

“EPA has modified the North-Central Zone U-factor to 0.30 based on comments received and conversations with manufacturers. This change recognizes the large number of products already being made at that U-factor and the additional cost required for a small improvement in performance.”⁸

WDMA supports EPA’s decision to raise the specification, and was pleased to see that the Agency appropriately applied both the product availability and cost-effectiveness principles in this zone.

⁷ *Response to Comments on Draft 2 Windows Criteria*, Comment #61, p. 21-22.

⁸ *Response to Comments on Draft 2 Windows Criteria*, Comment #60, p. 21.

At the same time, we are surprised by the significant differences in EPA's approach to the North-Central Zone revision, as compared to the Northern and South-Central Zones. In the North-Central Zone, EPA acknowledged that product availability is important, and justified its decision, in part, on the fact that "a large number of products are *already being made*" at a U-factor of 0.30. In the Northern Zone, in contrast, EPA dismissed stakeholders' concerns regarding product availability, and relied instead on unsupported claims that there will be a sufficient supply of double-pane windows to meet the criteria. In addition, EPA accepted stakeholder comments on the relative cost-effectiveness of setting the North-Central Zone U-factor at 0.29 and 0.30, and settled on 0.30 due to improved cost-effectiveness. In the Northern Zone, in contrast, EPA did not include any high-cost data points in its analysis and instead relied on a last minute revised payback analysis to justify retaining the 0.27 U-factor.

2.1.4 EPA should apply its principles consistently, and raise the Northern and South-Central Zone specifications

The Agency's approach in the North-Central Zone demonstrates that less stringent specifications are warranted where product availability and cost-effectiveness are at stake. WDMA's review of EPA's decision-making rationale indicates the Agency applied the ENERGY STAR guiding principles inconsistently and did not provide a justification for its actions that is consistent with the public record. As a result, EPA should ensure that ENERGY STAR principles are applied equitably across climate zones, and raise the U-factors in the North and South-Central Zones.

2.2. Concerns regarding EPA's original and revised payback analysis

In Draft 2 comments, WDMA and many other stakeholders raised significant concerns regarding EPA's payback analysis, including the exclusion of triple-pane windows from the dataset, the absence of information regarding EPA's underlying data, and the incremental and marginal cost assumptions. As noted previously, all public stakeholder input addressed the likely underestimation of costs and payback periods. There were no public comments claiming that EPA's cost analysis was conservative.

In response to these comments, EPA has provided additional information on its original cost-effectiveness analysis and introduced a revised cost-effectiveness approach with the Final Draft specification. WDMA appreciates EPA's efforts in providing this additional information, but does not believe that this response addresses the issues raised by stakeholders.

Our specific concerns are discussed in the following four sub-sections: (1) EPA's reluctance to provide a better explanation of the information on the cost data provided by manufacturers; (2) EPA's inappropriate treatment of data provided on triple-pane windows; (3) EPA's rationale for developing the revised payback analysis; and, (4) EPA's changes to the cost assumptions used in the original analysis.

2.2.1 EPA has not made available key information on data provided by manufacturers

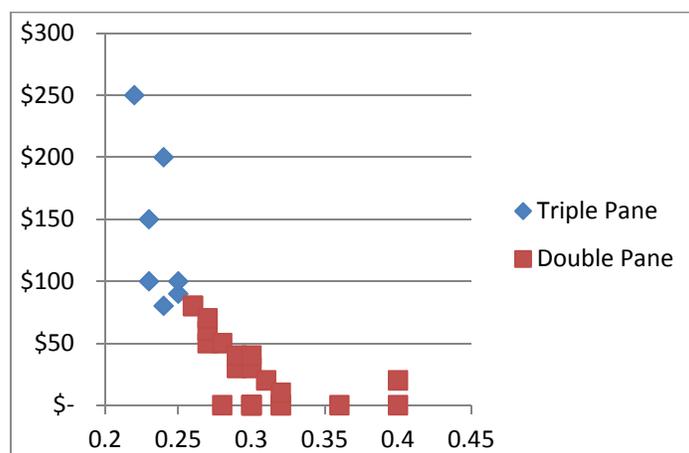
WDMA remains concerned by EPA's unwillingness to provide important details regarding cost data provided by the eight manufacturers that responded to EPA's 2011 information request. EPA has not identified the manufacturers who submitted cost data, nor offered an explanation as to why this information cannot be provided while maintaining adequate confidentiality. While we appreciate EPA's release of this additional information, we find it to be insufficient. The Agency has released only general information regarding the eight manufacturers, specifically that three of them are among the top-20

window manufacturers, three are among the top-100 manufacturers, and the two remaining are regional suppliers.

EPA should not withhold information unless it has concluded that there is a plausible risk of competitive harm, and such a demonstration has not been made. The information EPA has provided does not enable an evaluation of the representativeness of the companies that supplied data. As a result, it is not possible to assess the representativeness of the underlying data on which EPA's decisions rely.

Information characterizing the cost data EPA received from manufacturers has also been withheld from the public, with EPA again citing the need for confidentiality. While we recognize that EPA needs to carefully ensure that confidential information is not compromised, we do not understand why EPA cannot develop an approach that respects both the confidentiality needs of the eight manufacturers, and the legitimate need of EPA's stakeholders. This information is critical to understanding the information on which EPA is basing its decisions and to the ability of stakeholders to assess the Agency's decisions. EPA should be able to release blinded data without causing competitive harm to the manufacturers. In our view, EPA could for example, make a simple scatter plot depicting the submitted cost data for each U-factor available to the public. An example of what we recommend is found in Figure 1, which was developed using the mock data EPA released with the Final Draft specification.

Figure 1: Scatter plot of EPA cost data, by U-factor (illustrative data only)



If EPA believes that this type of chart could compromise the confidentiality of cost data provided by specific manufacturers, they should explain why. Such transparency in the Agency's reasoning would serve as a basis for determining how this information could be appropriately shared with stakeholders.

2.2.2 Concerns regarding the exclusion of triple-pane cost data provided by manufacturers

We are also concerned that EPA continues to exclude triple-pane cost data from its data set. As we commented on Draft 2, EPA justified the decision to exclude triple-pane windows based on their high cost⁹, and in the Final Draft, EPA continues to insist that "manufacturers can meet the proposed

⁹ Comment 62, Draft 1 Comment Response Summary, and Draft 2 Review of Cost Effectiveness Analysis, explanation for Table 1 "EPA excluded triple pane products from its analysis for the reasons highlighted in the Draft 1 Report and detailed in the next section (i.e. Section entitled "Triple-Pane Windows", page 5.

specification using either double- or triple-pane windows.”¹⁰ However, EPA’s recently released summary of the windows cost data further substantiates our serious doubts regarding this decision. From that data it is clear that triple-pane windows accounted for almost 70% of all cost estimates provided for the Northern Zone and one-third of all the cost estimates submitted for all zones.¹¹

It is troubling that EPA’s previous descriptions of the data set did not acknowledge the amount of triple-pane data received from manufacturers. In fact, although the Agency excludes triple-pane windows from the analysis, it continues to count them in the overall dataset. As EPA explained in the *Review of Cost Effectiveness Analysis* released with the Final Draft specification:

“EPA received 92 incremental price points from eight companies, though 12 data points were excluded from the dataset because either the datasets were incomplete or the ratings were achieved using an attachment product. EPA aggregated the remaining data in an Excel spreadsheet. ... EPA then filtered this data by U-factor and SHGC (less than or equal to the proposed criteria for a given zone), as illustrated in Figure 2 and 3.”¹²

The clear implication of EPA’s statement is that 80 data points were used in the cost effectiveness analysis. Following release of the additional windows data, however, it is now clear that EPA used far less data in the analysis, because one-third of all data submitted were for triple-pane windows (28 data points out of the acknowledged 80) and these data are excluded.

EPA’s decision to exclude triple-pane windows also appears inconsistent with the instructions provided to the eight manufacturers who submitted data. As EPA explained in the Draft 1 Report:

“Eight manufacturer partners provided basic product data for best-selling ENERGY STAR qualified double-hung windows and the added cost to consumers to achieve 0.01 incremental improvements in U-factor and SHGC. All incremental costs were to be for the same size window as the best-selling product and manufacturers were asked to provide product data for the best-selling or cheapest windows at each incremental U-factor or SHGC. Based on this data, EPA arrived at the incremental costs provided in Table 5.”¹³

These manufacturers – following EPA’s direction – submitted 28 cost estimates for triple-pane windows, 25 of which met EPA’s proposed specification for the Northern Zone. EPA has not provided any information that indicates that these cost-estimates were not consistent with the guidance as summarized in the Draft 1 Report. EPA should not have excluded these windows without specific evidence that they were not “the best-selling or cheapest” windows.

Thus, it appears that EPA did not communicate clearly with stakeholders. One-third of all data submitted to EPA was triple-pane, all of which was excluded. This means that EPA used only 52 of the 90 original data points submitted. In addition, because the Agency analyzes each climate zone

¹⁰*Review of Cost Effectiveness Analysis*, p. 5.

¹¹*Characterization of Window Data*, table on p.2

¹²*Review of Cost Effectiveness Analysis*, p. 2

¹³*Draft 1 Report*, p. 27.

separately, only 11 double-pane data points were used in the Northern Zone.¹⁴ Almost 70% of data submitted for the Northern Zone data was triple-pane and all of it was excluded from the analysis.

In addition, in the Final Draft, EPA added a new justification for excluding triple-pane windows, stating that “including triple-pane products in this analysis would be inconsistent with how cost-effectiveness is determined in other ENERGY STAR product categories.”¹⁵ WDMA’s review of a number of recent revisions in other product categories did not identify a single situation in which EPA chose to exclude an entire category of products from a cost-analysis because they were too expensive. EPA should provide specific information demonstrating that the program analysis for windows is the same as other ENERGY STAR product categories.

The fact that triple-pane windows represent the majority of data points provided by manufacturers in the Northern Zone casts doubt on EPA’s claim that cost-effective double-pane windows meeting the Northern Zone specifications will be adequately available in this region when Version 6.0 is finalized. WDMA’s review of product availability information does not support widespread availability of double-pane products in the Northern Zone, and EPA has not yet explained how sufficient product will be available when the revised specification takes effect. EPA has claimed that the Draft 1 Report confirms its revisions, stating:

“EPA believes that Figure 7 of the *Draft Criteria and Analysis Report* clearly demonstrates that double-pane windows are currently available to meet the proposed criteria. Based on discussions with manufacturers, EPA believes double-pane products that meet the proposed specification will be widely available when the proposed specification takes effect.”¹⁶

WDMA draws a very different conclusion from Figure 7. An evaluation of the data in Figure 7 for U-factors ranging from 0.25 – 0.27 shows that approximately 2.2% of all products available for sale are found in that range, whereas the CPD distribution is over five times higher (~11.3%). This is a troubling discrepancy, even without accounting for the fact that the CPD also includes two orders of magnitude more products at these levels (~70,500 for the CPD and ~700 for the Products Available for Sale).

The treatment of triple-pane windows in the cost analysis is important because it directly affects the viability of the proposed Northern Zone specification. WDMA has raised significant concerns regarding both the availability and cost-effectiveness of the proposed Northern Zone criteria, yet EPA has failed to provide a compelling justification for its assumption that double-pane windows will be available in sufficient quantities when the specification goes into effect. Given the new information regarding the significance of triple-pane windows in the Northern Zone – based on cost information provided by manufacturers at EPA’s request – the Agency should include triple-pane costs in its payback analysis and take the results of such analysis into account in establishing the Version 6.0 specifications.

2.2.3 Concerns regarding EPA’s rationale for developing the revised payback analysis

WDMA and many other stakeholders expressed concern regarding EPA’s original payback analysis during the public comment period for both Draft 1 and Draft 2 proposed specifications. The thrust of

¹⁴ *Characterization of Windows Data*, table on p. 2. -

¹⁵ *Review of Cost Effectiveness Analysis*, p. 5.. -

¹⁶ *Response to Comments on Draft 2 Windows Criteria*, Comment #73, pp. 25-26. -

these comments was that EPA's cost assumptions, and the resultant payback analysis, were overly optimistic. As mentioned previously, no public comments expressed concern that EPA's analysis was too conservative. In the Final Draft, EPA responded to these comments by releasing a new paper, the *Review of Cost Effectiveness Analysis*, which includes a revised payback analysis using brand new assumptions.

WDMA appreciates this additional information as it helps in understanding how EPA developed its analysis. Based on our review, however, we have significant concerns with EPA's revised cost-effectiveness analysis, because the Agency has not explained why this new analysis was necessary or responded adequately to public comments on Draft 2 regarding cost issues. EPA explained its rationale for developing the new analysis as follows:

"In its initial analysis, EPA chose a series of very conservative assumptions to confirm that in the majority of instances (even with higher-cost products), consumers would be likely to see a return on their investment within the lifetime of the product as described in the *ENERGY STAR Products Program Strategic Vision and Guiding Principles* documents. Having confirmed that this was the case across a wide variety of scenarios, EPA has now evaluated the payback delivered in the Final Draft specification with a focus on lower and average cost products (as is done for the other ENERGY STAR product categories)."¹⁷

As described in detail below, we find that this rationale is inconsistent with EPA's prior statements on its original analysis, and ignores significant comments from WDMA and other stakeholders regarding the original analysis.

First, EPA's claim that "a series of very conservative assumptions" were used in the original cost-effectiveness analysis is inconsistent with the public record. EPA's approach to the original analysis was described in the Draft 1 Report. Nowhere in that report does EPA characterize its cost assumptions as "conservative" much less, "very conservative." Instead, EPA characterizes its cost assumptions for windows as "reasonable."¹⁸ It is not clear why EPA now appears to be characterizing some of its original assumptions differently, especially given the significant issues raised in public comments. If EPA was being "very conservative" in the original analysis, a more detailed explanation of how and why should be provided.

Similarly, EPA has not previously characterized the intent of the original analysis as confirming that "even with higher-cost products" consumers would likely see a reasonable payback period. Nowhere in the *Draft 1 Version 6.0 Criteria and Analysis Report* does EPA state that the original cost-effectiveness analysis was intended to focus on higher cost products. To the contrary, available information confirms that EPA did not intend to produce a high-cost analysis. If EPA intended to develop a very conservative, high-cost analysis, it would not have excluded triple-pane products from the analysis. Instead, the Agency excluded triple-pane windows, stating:

¹⁷*Review of Cost Effectiveness Analysis*, p. 10

¹⁸*Draft 1 Version 6.0 Criteria and Analysis*, p. 28. EPA stated: "The data in Table 5 demonstrates that the additional cost to manufacturers is *reasonable*." (emphasis added) Table 5, which is found on p. 27, is titled "Average Incremental Product Costs Across Climate Zones, and depicts the total cost increase for the Draft 1 proposed specifications in each zone.

“Similarly, double-pane windows are typically much more cost-effective than triple-pane windows (see “incl. triple-pane” in Table 5 above). As such, EPA has not considered the incremental costs of triple-pane windows since the program focuses on promoting cost-effective products for consumers.”¹⁹

EPA’s approach is particularly troubling given that the triple-pane data represents almost 70% of the data provided by manufacturers for the Northern Zone and was excluded because it was not “cost-effective.”

Third, EPA has not fully responded to WDMA’s concerns regarding what it means to receive a reasonable return on investment. As discussed further in Section 2.3 of these comments, EPA continues to simply assert that “within the lifetime of the product” is a reasonable payback period despite available research indicating that consumers expect much shorter payback periods (of 7-10 years), as presented in our Draft 2 comments.

In light of EPA’s position that payback within the life of the product is sufficient, it is unclear why the Agency decided to produce the revised analysis. By and large, payback periods in the original analysis were less than 25 years, and, in any case, EPA dropped the cities with the longest payback periods from the analysis on various grounds. EPA’s decision to produce a revised payback analysis would seem to confirm that consumers do not consider payback periods of more than 10 years to be a “reasonable return on investment.”

Only by dramatically reducing the original cost assumptions and changing its analytical approach, was EPA able to reduce payback periods. On that basis, EPA repeatedly asserts in its response to comments that the windows specifications deliver reasonable payback periods, stating:

“EPA has also done additional analysis on payback periods for the proposed final draft specification. These analyses indicate payback periods of 10 years or less for low- and average-cost products in most of the cities for which EPA has performed energy savings analyses.”²⁰

EPA is also claiming that the revised payback analysis is more consistent with cost-effectiveness analyses conducted for other ENERGY STAR product categories. The Agency has not identified those other ENERGY STAR categories, and after reviewing many of the product revisions found in the EPA ENERGY STAR archives, WDMA has found no evidence to support this statement.

Additionally, it appears EPA has used dual pane clear data for “IES” in the payback equation when data for a low-e code compliant windows should be used. As EPA has stated, the payback period should reflect savings with the proposed ENERGY STAR criteria over a code compliant product. If the IES for a low-e compliant window was used, the payback periods would be even greater.

Finally, although EPA claims at the outset of the *Review of Cost Effectiveness Analysis* that the review of additional payback periods covers “different cost levels,” the Agency has released only selected scenarios. While it appears that EPA assessed low, average, and high cost scenarios, results from only a

¹⁹Draft 1 Version 6.0 Criteria and Analysis Report, pp. 27-28 -

²⁰Response to Comments on Draft 2 Windows Criteria, Comment #27, and several others. -

few of these scenarios are available to the public. Specifically, EPA has released the pay-back periods for the revised low- and average-cost scenarios across all zones, and pay-back periods by U-factor for the low-, average-, and high-cost scenarios with the marginal cost assumption from the original analysis, for the Northern Zone.²¹ Given EPA's revisions to the North-Central and South-Central Zone specifications, and our significant concerns regarding EPA's use of inconsistent rationale in revising the proposed specifications in different climate zones, WDMA requests the Agency release results for all climate zones and all scenarios.

For these reasons, WDMA concludes that EPA's decision to develop the revised payback analysis was not a reasonable response to the concerns raised in public comments on the original analysis. Rather than addressing concerns about the over-optimism of the original analysis, EPA overhauled its analytical approach and developed even more optimistic assumptions. We urge the Agency to more adequately address our concerns.

2.2.4 Concerns regarding EPA's revised cost-assumptions

Another significant area of concern is EPA's justification for changes made to the cost assumptions used in the original and revised payback analyses. After receiving feedback through public comments on both Draft 1 and Draft 2 that its cost assumptions were too low, EPA is now asserting that its cost assumptions were actually too high. On this basis, it has changed its approach for developing both the marginal and incremental costs used in the analysis.

With respect to the marginal cost analysis, EPA's original analysis used a marginal cost of \$20/window, which was explained as follows:

“Based on feedback from manufacturers, the current marginal cost between their current best-selling ENERGY STAR qualified window and the next poorer-performing window (sometimes IECC 2009-compliant, sometimes double-pane clear) is about \$20.”²²

WDMA asked for more information on this assumption in both its Draft 1 and Draft 2 comments. In the *Review of Cost Effectiveness Analysis*, EPA responded to our comments by abandoning the justification provided in the Draft 1 Report, and adopting dramatically lower marginal cost estimates. In explaining this change, EPA stated:

“As noted in the marginal cost section, most manufacturers indicated no marginal cost between their current, best-selling ENERGY STAR window and their next poorer-performing window. One manufacturer indicated a cost of \$20, so EPA used this marginal cost in the original analysis to be conservative. However, it may be more accurate to consider paybacks associated with a \$10

²¹ Figure 6 depicts payback periods using the low and average revised cost assumptions, as described in the *Review of Cost Effectiveness Analysis*. The low-cost results assume a marginal cost of \$5 (the average of \$0 and \$10) and a low incremental cost of \$24.66, for a total additional cost of \$29.66/window. The average cost results also use a marginal cost of \$5 and an average incremental cost of \$34, for a total additional cost of \$39/window. Figure 8 contains results for low-, average- and high cost scenarios for the Northern Zone, calculated using incremental costs of \$24.66 (low), \$34 (average), and \$41 (high), and a marginal cost of \$20 (as presented in the Draft 1 Report.)

²² *Review of Cost Effectiveness Analysis*, p. 28

or a \$0 marginal cost, because most manufacturers with whom EPA discussed this issue (both in 2011 and more recently) indicated they had no marginal cost. EPA considered two marginal cost options for the revised payback analysis.”²³

EPA has thus reduced its marginal cost assumptions by 50% to 100%, as compared to the original analysis.

Based on EPA’s explanation for this change, we can only conclude that the Agency received additional and different marginal cost information outside of the public comment process. As with other issues in the Final Draft proposal, EPA’s justification appears to depend on the consensus of “most manufacturers” whom EPA consulted on this issue. However, we don’t know which manufacturers were consulted, or what information they provided, nor has EPA identified the flaws in its original assumptions. In short, stakeholders have no idea why the Agency abandoned the confidential input received at the beginning of the process, in favor of confidential conversations held more recently. This change has a profound impact on payback, and EPA needs to be more thorough and transparent in its approach.

In revising the incremental cost assumptions, EPA used the cost data originally provided by manufacturers, in a manner that generated significantly different results. Specifically, EPA decided to use median, not mean, values in order to avoid “potential skewing of the data set.”²⁴ This is a confusing claim, because EPA should know whether or not the data are skewed. The Agency has not explained why it believes that its current double-pane data set is skewed. In fact, it appears likely that EPA actually introduced skew into the dataset when it decided to exclude all triple-pane data submitted by manufacturers. Although almost 70% of the Northern Zone data and 33% of all cost data submitted by manufacturers was for triple-pane product, EPA excluded that data from the analysis on the grounds that double-pane windows were “much more cost-effective.” In so doing, EPA eliminated relevant high-end cost estimates and skewed the data toward the low-end of the distribution.

The Agency’s decision to exclude triple-pane windows has caused EPA’s original analysis to be overly optimistic, and there appears to be no justification for EPA to further constrain its revised payback analysis by focusing on only the lowest cost double-pane values in each climate zone. For the Northern Zone, the result of EPA’s new approach is a low-cost incremental value that relies on only six data points, or less than 15% of the Northern Zone data submitted to the Agency. As such, this is a very best case scenario that is unlikely to be realized in many cities, under many circumstances, or across product lines.

Given the ENERGY STAR program’s commitment to both energy and cost savings, EPA should not be using overly optimistic payback analyses to establish its specification revisions. EPA should abandon the revised payback analysis and set the Version 6.0 specifications based on a comprehensive analysis of all data provided by all manufacturers, including both double- and triple-pane windows.

2.3 Concerns regarding lengthy payback periods

²³ *Review of Cost Effectiveness Analysis*, p. 10

²⁴ *Review of Cost Effectiveness Analysis*, p. 10

Many stakeholders are extremely concerned by EPA's view that payback periods within the lifetime of the product are acceptable, regardless how long-lived the product is. As discussed below, WDMA has concluded that (1) EPA has misinterpreted the meaning of the 3rd guiding principle; (2) available research on payback periods does not support EPA's position; and (3) EPA's own practice in other specifications supports significantly shorter payback periods.

First, WDMA finds EPA's characterization of the 3rd guiding principle incomplete and inaccurate. The actual guiding principle simply states that "purchasers will recover their investment in increased energy efficiency within a reasonable period of time."²⁵ There are no references to the "life of the product" in the principle. In fact, this concept is introduced only in the discussion of the 3rd principle, in the following statement:

"ENERGY STAR specifications are set so that if there is a cost differential at time of purchase, that cost is recovered through utility bill savings, within the life of the product, generally between 2 and 5 years."²⁶ (emphasis added)

It is WDMA's opinion that the phrase "generally between 2 to 5 years" is a caveat, indicating that the ENERGY STAR program did not originally envision payback periods of 10, 15, or 20 years. Beyond a certain period, consumers no longer receive a reasonable payback on their investment, even if the product will be paid off in energy savings by the end of its lifetime.

Second, WDMA has provided EPA with specific evidence on consumer views regarding payback for home improvements. In our comments on the revised Draft 2 skylight specification, for example, we quoted Lowe's on this point:

"Customers are generally impatient when it comes to payback, and seven years can exceed their tolerance, and that's recognizing that most of the payback periods were in the 20+ range. Our research has shown Customers are willing to select the environmentally responsible product but only when the performance meets or exceeds the conventional product and with a minimal price premium."²⁷

In addition, EPA's assertion that consumers are willing to accept long payback periods is not supported by consumer preference research conducted by the National Association of Home Builders (NAHB). NAHB posed the question "How much extra would you pay up front, in the purchase price of your next home, if it would save \$1,000 every year in utility costs?"²⁸ According to a NAHB Consumer Preference Survey:

"NAHB policy on cost effective energy efficiency code provisions specifically requires that the payback period to the home buyer not exceed 10 years. This 10-year threshold is based on the

²⁵ US EPA, *Strategic Vision and Guiding Principles*, p.4. -

²⁶ Op cit. -

²⁷ WDMA, *Comments on ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 6.0 Revised Specification for Skylights*, quoting Lowe's, *Draft 2 of the ENERGY STAR for Windows, Doors, and Skylights Version 6.0 Specification*, March 8, 2013, p. 7. -

²⁸ National Association of Home Builders, *Comments of the NAHB on a DOE Request for Information – Building - Energy Codes Cost Analysis*, Docket No. EERE-2011-BT-BC-0046, November 17, 2011, p. 12. The question was posed in a NAHB 2007 Consumer Preference Survey. -

longest relevant payback period that can be found in an NAHB home buyer preference survey (see table below).”²⁹

Data in the NAHB table indicated that the median of the data was \$5,000 - \$6,000, or a 5- to 6-year payback, across all incomes. The mean of the data was higher, ranging from \$7,500 - \$10,100 as incomes increased.³⁰

EPA’s belief that consumers are willing to accept long payback periods is not confirmed by available information, and the Agency has not made the case that the “life of the product” is reasonable. Without supporting information, EPA’s position is unjustified. It also appears that EPA’s decision to develop a revised payback analysis for the Final Draft specification is a tacit acknowledgement that the payback periods associated with the Draft 2 specification were too long. If the “life of the product” were a defensible position, EPA would presumably have no need to develop a scenario with payback periods of less than 10 years.

Third, past decisions made by EPA for other ENERGY STAR product categories support WDMA’s view that payback “within the life of the product” is not acceptable for products with long lifetimes. In 2009, for example, EPA decided not to move forward with a revision for the ENERGY STAR specification for residential gas furnaces, citing long payback periods:

“Based on limited review of the current market, EPA has concluded that the simple payback associated with a 92% AFUE versus a 90% AFUE is generally more than five years (due in large part to the costs associated with condensing versus non-condensing technologies.) In light of the ENERGY STAR program principle promising consumers money savings, EPA feels that revising the AFUE requirements for qualified gas furnaces is premature at this time.”³¹

The contrast between EPA’s approach in the 2009 furnace revision and EPA’s approach to the Version 6.0 revision for windows, doors and skylights is stark. In its decision on the gas furnace revision, EPA acknowledged that a simple payback of *more than 5 years* was not consistent with the ENERGY STAR brand promise. Furnaces have a lifetime of 15 years or more, but EPA did not assert that “payback within the life of the product” was reasonable. Instead, the Agency evaluated public comment from stakeholders and responded by postponing the revision.

Based on our review, WDMA continues to believe that EPA’s repeated reliance on payback within the “life of the product” is unreasonable. EPA should reconsider this approach and to ensure that the final Version 6.0 specification delivers on the ENERGY STAR brand promise. To do anything less is to betray the trust of consumers and undermine the ENERGY STAR program.

2.4 Concerns regarding product availability in the Northern Zone

In our Draft 2 comments, WDMA raised specific issues regarding product availability in the Northern Zone. We provided a detailed analysis regarding the limited availability of products with U-factors of

²⁹ Op cit. The cited information summarized data from an NAHB 2007 Consumer Preference Survey.

³⁰ Op cit. The cited information summarized data from an NAHB 2007 Consumer Preference Survey.

³¹ US EPA, *Letter to ENERGY STAR furnace partners and other interested stakeholders*, February 26, 2009, http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/Funaces_Memo_V2.1.pdf?bd10-74f5

0.27 or below, as reflected in the Products Available for Sale database. Based on our assessment, we concluded that EPA has not demonstrated adequate product availability based this database, which is the appropriate dataset to use for the availability analysis, and we explained why the CPD is not appropriate for this type of analysis. We also noted the significant role EPA ascribes to the assessment of product availability when revising ENERGY STAR specifications and urged the Agency to set a U-factor of no less than 0.29 in the Northern Zone.

In the Final Draft, EPA has not modified its proposed specification for the Northern Zone, nor has the Agency provided specific information in response to our comments. Instead, we find EPA's responses to be very general. EPA has downplayed the importance of product availability in setting revised specifications by asserting that "this figure [product availability of 25%] is provided as a reference and is not a goal, metric, or rule for criteria setting."³² We are less concerned with what term to use, than whether EPA is properly assessing availability and sufficiently justifying its decisions.

In that regard, as demonstrated by the comment/response on this issue released with the Final Draft, EPA did not address our specific concerns:

WDMA Comment (as summarized by EPA): One commenter believes that a U-factor of 0.27 in the Northern Zone is too stringent and that the U-factor should be no lower than 0.29 to ensure that sufficient products will be available. The commenter found that 6% of products in the CPD are certified for a U-factor of 0.27 and 12% of the products are certified for U-factors of 0.25 – 0.27, which indicates that a U-factor of 0.27 cannot meet the 25% product availability metric. The commenter also found that 4% of products available for sale have a U-factor of 0.26 or 0.27, and 8% of products have a U-factor of 0.27 or less, which further indicates that a U-factor of 0.27 cannot meet the 25% product availability metric. The stakeholder calculated that 13% of available products have U-factors of 0.26-0.28, while 18% of products in the CPD have U-factors of 0.26-0.28. The commenter also found that 27% of products have U-factors of 0.27-0.29 based on EPA's CPD analysis and products available for sale analysis, which indicates that a U-factor of 0.29 would meet the 25% product availability metric.

EPA Response: EPA believes that the proposed Version 6.0 requirements will result in a wide selection of products for consumers from numerous manufacturers at the time of specification implementation. EPA has arrived at this conclusion by analyzing and comparing the NFRC CPD and the Products Available for Sale Database, which contains more than 17,000 products. The comparison of the CPD and the Products Available for Sale Database was extremely useful when trying to understand what products might be available once the proposed revised specification takes effect. In addition to these two databases, EPA reviewed and discussed current technological advancements with product manufacturers, component manufacturers, and testing organizations to confirm availability and performance. Finally, there is historical evidence that shows that ENERGY STAR market share for windows has remained strong after previous criteria revisions.³³

³² *Response to Comments on Draft 2 Windows Criteria*, Comment # 70, pp. 24-25.

³³ Op cit.

This response does not directly respond to, or rebut, the issues we raised. It restates basic information that is not relevant to our specific concern. The response also relies heavily on conversations conducted outside of the public process to “confirm availability and performance.” As a result, the public record does not support EPA’s decision. EPA does not explain how manufacturers will get from the current situation (extremely low product availability) to sufficient supply by the time the specification goes into effect. Instead, the Agency repeatedly asserts that there will be a “wide selection” of products available when the time comes. In our Draft 2 comments on the implementation date, we provided detailed information on tasks that manufacturers must complete in order to qualify ENERGY STAR products.³⁴ It would be extremely helpful if EPA could provide comparable detail explaining its reasoning; simply mentioning that they used the CPD and Products Available for Sale databases is insufficient.

In addition, EPA’s general description of how it used the CPD and Products Available for Sale databases does not address the critique we provided in our Draft 2 comments, and is thus off-point. We note that while there may be 17,000 products in the Products Available for Sale database, only about 4% of them have a U-factor of 0.27 or below. In addition, while the CPD includes more products, even EPA agrees that these products are not on the market (and most never will be). EPA may believe that manufacturers will be ready by the implementation date, but the Agency has not yet explained the process by which qualified products will come on line in time.

2.5 Conclusion

In summary, WDMA requests EPA to finalize the Version 6.0 revision with a U-factor in the Northern Zone to 0.29 or higher. This change will improve cost-effectiveness and product availability, provide a consistent approach to specification setting across climate zones, and better reflect the public input and the public record. For similar reasons, we request EPA to increase the U-factor in the South-Central Zone from 0.30 to 0.32.

We also urge the Agency to redouble its efforts to explain its decisions and reduce its reliance on conversations and data collection activities that occur outside of the public process. EPA’s current approach does not provide sufficient information for stakeholders to evaluate EPA’s decisions, which creates significant concerns regarding the transparency of the process. Decisions that cannot be understood based on the information contained in the public record are not transparent and do not reflect well on the ENERGY STAR program.

Section 3: WDMA concerns on the proposed skylight specifications

In the recently released Final Draft proposal, EPA has made some important changes to the Draft 2 specifications. We appreciate that EPA has proposed raising the U-factor in both the Northern and North-Central Zones from 0.47 to 0.48, and that the Agency has increased the Solar Heat Gain Coefficient (SHGC) in the South-Central zone from 0.25 to 0.28. These changes are a first step toward addressing some of our significant concerns.

At the same time, WDMA is not fully satisfied with EPA’s response for a number of reasons. First, we continue to have concerns regarding the validity of EPA’s product availability analysis in the Northern

³⁴ WDMA comments, February 8, 2013, p. 8.

and North-Central Zones. Second, EPA has not responded adequately to our issues regarding the cost-effective analysis, and has not provided any indication of how the changes proposed in the Final Draft impact payback periods. Finally, we are troubled by the lack of transparency in the skylights analysis. Very little data or information has been made available to stakeholders, and EPA has not provided any update to previous assessments of cost-effectiveness, payback, and product availability for the proposed Final Draft specification. Because there is insufficient information in the public record, it is simply not possible for stakeholders to fully evaluate the proposed specification, which undermines the credibility of EPA's approach.

Thus, we do not believe that EPA's Final Draft proposal addresses our concerns. We urge EPA to increase the Northern and North-Central Zone U-factors to at least 0.50, and to raise the South-Central Zone U-factor to 0.55 and the SHGC to 0.30. We also ask the Agency to make additional information available regarding its data and analysis to enable stakeholder review of Agency decisions.

3.1 Concerns regarding the product availability analysis

Over the course of the Version 6.0 process, WDMA has repeatedly raised concerns regarding EPA's availability analysis for skylights, especially in the Northern Zones. After reviewing the Draft 1 Report, for example, we commented that product availability would be very limited for the proposed Draft 2 U-factor of 0.45, and when EPA decided to issue a revised Draft 2 proposal raising the Northern Zone U-factor to 0.47, we pointed out that there were no additional products available at that level in the Products Available for Sale Database.

In the Final Draft, EPA has proposed another modest upward revision for both the Northern and North-Central zones, from 0.47 to 0.48, and again it appears that sufficient product availability cannot be guaranteed when the specification takes effect. Unfortunately, raising the U-factor to 0.48 increases current product availability in the Northern zones by less than 2 percent over remaining at 0.47 (from 13% to 15% availability). Based on data provided in Figure 30 of the Draft 1 Report, there are less than 10 products currently available for sale at a U-factor of 0.48, and no products currently available at 0.46 or 0.47.³⁵

In fact, over 80% of the products that would qualify for the Northern Zone specification at 0.48 have a U-factor of 0.43 or below.³⁶ This is an important consideration in setting the standard, because Figure 28 of the Draft 1 Report indicates that triple pane windows dominate the market below 0.42/0.43, whereas double-panes are more prevalent at U-factors of 0.43 or above³⁷. Unfortunately, EPA has not released any information regarding the number of triple-pane products available for sale, which it did provide in its analysis of the windows specification. For skylights, however, the Agency has focused solely on double-pane product; this is a problem because it prevents stakeholders, or the Agency, from undertaking a comprehensive assessment of the skylights market.

³⁵ Draft 1 Report, Figure 30, p. 47. -

³⁶ Op cit. -

³⁷ Draft 1 Report, Figure 28 -

We have also reviewed the additional information on product availability released by EPA on September 4, 2013, and we find that it confirms our previous conclusions. EPA collected additional data on skylight availability and cost from the web for major retailers and presented results for two (Menard's and Home Depot). There were 20 data points in the table provided by EPA at U-factors of 0.48 or below. As in the initial Product Available for Sale database, there were no skylights available at U-factors of 0.46 or 0.47, and in this dataset there was only one available at 0.48.³⁸

EPA believes that this updated analysis "demonstrates that a majority of fixed skylight products being marketed on a national basis already meet or exceed the proposed Final Draft Northern Zone criteria."³⁹ We disagree. The newer information is consistent with the results of EPA's original analysis. Raising the specification from 0.47 to 0.48 will have no appreciable effect on product availability in the Northern or North-Central Zones.

We have also reviewed EPA's new information for additional insights on the availability of different skylight subtypes. As explained in our Draft 2 comments, different skylight subtypes are not interchangeable without significant rework. EPA's response to this input was as follows:

EPA understands that not all skylight subtypes can be used in every application. As noted previously, EPA collectively reviewed and analyzes all skylight types so it could use as broad a dataset as possible to perform the criteria revision analysis. EPA has worked closely with manufacturers since publishing the Draft 2 specification to determine what U-factor criteria to propose to account for the variance in performance across skylight subtypes.⁴⁰

We appreciate EPA's recognition that skylight subtypes are not interchangeable, but continue to have concerns regarding the approach used in the product availability analysis. While we understand why EPA would want to perform its analysis using a large dataset, in this situation such an approach is not appropriate. By combining different subtypes in a single broad dataset, EPA has essentially treated all skylights as interchangeable and thus overstated the availability of qualified skylights across the Northern Zones. The proper way to assess availability under these circumstances is to evaluate the subtypes separately. By doing so, EPA could then determine whether there was likely to be broad availability of each relevant subtype at the selected U-factor, or whether there were problem areas for certain subtypes.

Based on comments submitted by VELUX America, it is clear that there are serious concerns regarding the potential for curb-mounted skylights to qualify for the ENERGY STAR label at a U-factor less than 0.49.⁴¹ A review of the recently released skylight data confirms this conclusion; of the 20 qualifying skylights at 0.48 or below, 12 of them were deck mounted, 7 were pan-flashed, and only 1 was curb-mounted.⁴² Given the significant market for curb-mounted skylights, this conclusion is troubling to

³⁸ US EPA, *Additional Research on Skylight Availability and Cost*, September 3, 2013 -

³⁹ Op cit., p. 1 -

⁴⁰ US EPA, *Response to Door and Skylight Comments – ENERGY STAR for Windows, Doors, and Skylights Version 6.0 - Criteria Revision*, Comment #7, pp. 6-7. Hereafter referred to as the "Skylight RTC." -

⁴¹ VELUX America Inc., *Comments Regarding ENERGY STAR Product Specification – Residential Windows, Doors, and Skylights Eligibility Criteria Final Draft Version 6.0*, September 13, 2013. -

⁴² *Additional Skylight Research*, p. 1. This estimate reflects feedback provided by VELUX to EPA in its Final Draft - comments (see *VELUX Comments*, Addendum Comments) -

manufacturers and should also concern EPA. If there is insufficient availability of qualifying curb-mounted skylights (or they are unaffordable), consumers will likely purchase non-qualifying and poor efficiency products, which would be an unfortunate development for both the economy and the environment.

We are also troubled by the absence of any supporting data related to the product availability analysis apparently conducted in developing the Final Draft proposal. EPA states that it worked with manufacturers to determine what U-factor to propose that reflects the variance across different subtypes, but no information on EPA's analysis or conclusions is available in the public record. Without access to such information, stakeholders cannot evaluate the Final Draft proposal, which is a major problem given the potential consequences of an incomplete analysis or an improperly selected specification. The economic ramifications of getting the Version 6.0 specification wrong could be profound, and all stakeholders deserve an opportunity to weigh in on EPA's methodology, data and findings.

We thus urge EPA to make additional information available to stakeholders on its analysis, and reconsider the viability of the Final Draft specification proposed for the Northern and North-Central Zones. Based on the new data released by EPA, which is consistent with the data originally released in Figures 28 and 30 of the Draft 1 Report, and the significant issues associated with the characteristics of different skylight subtypes, WDMA has concluded that EPA's current proposal is still too stringent.

3.2 Concerns Regarding EPA's Cost-Effectiveness Analysis

EPA received significant input from public stakeholders regarding under-estimation of costs used in the cost-effectiveness and payback analyses. Although many of these stakeholders provided additional data to EPA, no new information – including updated results – have been released since the Draft 1 Report. EPA's responses also give the appearance that the data provided by stakeholders in public comments has not been taken on board, in part because the Agency has not provided any feedback to indicate that it reviewed or made any decisions regarding whether not to use the data. Instead, EPA's responses to public comment indicate that the Agency has relied on confidential conversations with manufacturers to make the case that the cost effectiveness is reasonable. The comment below provides an example:

Comment (as summarized by EPA): Two commenters believe that the marginal cost of \$30 will reduce the number of homeowners who buy energy efficient skylights, which seems to defeat ENERGY STAR's purpose. Another commenter believes that marginal costs increases of \$20-\$40 will cause some homeowners to select less energy efficient products that cost less. A fourth commenter sees the price increase of \$25-\$40 as limiting the number of customers who will upgrade from plastic to energy-efficient glass skylights, which will erode the ENERGY STAR brand. Dealers indicate that consumers will not select ENERGY STAR if the incremental cost is even \$20. This will result in higher energy use and greenhouse gas emissions.

EPA's Response: EPA appreciates the commenters' concerns about the effect of marginal cost increases on the market desirability of skylights. The ENERGY STAR mark is intended to direct consumers to products with superior energy performance. Consumers have a range of product options at varying price points and efficiency levels. If a consumer elects to spend more to purchase an ENERGY STAR product, the incremental cost of that decision will be recouped

within the lifetime of the product. EPA has worked closely with manufacturers to identify proposed final draft criteria that deliver on this tenet of the program.⁴³

This response does not respond to the specific cost information offered by commenters. Instead EPA provided a boilerplate response about the general goals of ENERGY STAR, and claimed that payback within the life of the product is reasonable. The Agency ended by noting that it “worked closely with manufacturers” to revise the proposed Draft 2 criteria. This statement does not acknowledge the concerns raised and provides no detailed information on EPA’s reasoning. It thus raises significant concerns regarding EPA’s process for developing the specifications. EPA’s responses indicate a very limited engagement with public input, which is inconsistent with the intent of public comment processes.

As with windows, our concerns have increased as we review EPA’s responses to public comment on the skylight specification. In the following comment, a stakeholder points out that EPA has not provided evidence demonstrating that proposed revisions are addressing stakeholder concerns regarding cost effectiveness. Put simply, the commenter is concerned that the Agency has not updated its initial skylight analysis from July 2012, despite multiple revisions. EPA’s response is disturbing:

Comment (as summarized by EPA): One commenter believes there is no evidence that recent revisions will result in any improvement to cost effectiveness.

EPA’s Response: To protect the confidentiality of data provided by manufacturers, EPA cannot supply additional information on how the revisions will improve cost effectiveness. EPA has, however, proposed additional changes to the specification to help improve cost effectiveness. If manufacturers submit additional data during the current comment period, EPA will review it to further evaluate the cost effectiveness of the proposed revised criteria.⁴⁴ (emphasis added)

This response is quite clear: EPA does not intend to update its original analysis because the data used by the Agency to justify the revisions is confidential. No explanation is provided as to why the data is confidential; in fact, no information of any kind is provided regarding the nature of the data EPA is relying upon.

WDMA finds it unreasonable to expect stakeholders to defer to EPA’s judgment on issues of fundamental relevance to both the companies that manufacture skylights and all of the consumers that count on the integrity of the ENERGY STAR brand when making purchasing decisions. Rather than informing stakeholders that “EPA cannot supply additional information on how the revisions will improve cost effectiveness,” the Agency should be actively seeking a way to address the legitimate concerns of stakeholders while ensuring that confidential information is protected. Stakeholders have a right of access to enough information to facilitate an independent evaluation of the Agency’s statements and decisions.

Finally, we note that EPA’s cost-effectiveness analysis suffers from the same weakness as the product availability analyses with respect to EPA’s decision to use a large dataset even though skylight subtypes are not interchangeable. Combining cost estimates for different subtypes in a single broad dataset is

⁴³ Skylights RTC, Comment #18, pp. 9-10.

⁴⁴ Skylight RTC, Comment #5, p. 22.

not appropriate unless the incremental cost of meeting the final Version 6 specification is similar across different subtypes. It is not clear if EPA has conducted such an evaluation; if they did, the results have not been made public. Even recognizing that EPA should still establish a single specification for each climate zone, this type of analysis would be very useful to ensure that consumers received reasonable payback regardless of the skylight subtype purchased.

3.3 Concerns Regarding Payback Periods

In our Draft 2 comments, we expressed concern regarding the long payback periods for the Version 6 skylight revision, and we provided significant information demonstrating that payback periods “within the life of the product” are not reasonable when product lifetimes are 20 years or more. The information we provided demonstrates that a payback period of 7 – 10 years is reasonable. For a full explanation of the evidence for this position, refer to Section 2.3 of these comments.

Here we want to emphasize our concerns regarding EPA’s ongoing reluctance to take stakeholder concerns regarding payback seriously in setting the Version 6 skylight specification. Unfortunately, as indicated in the comment/response below, EPA appears unwilling to engage in this core issue:

Comment (as summarized by EPA): Two commenters believe that the average homeowner is in a home for 7 years, so a payback of 30 years isn’t reasonable. Two commenters believe that the payback periods need to maintain a range that will attract consumers. One commenter sees the payback periods in the Southern, South-Central, and North-Central Zones as too long. One commenter believes that payback periods are unacceptable to consumers. Most paybacks were in the 20+ range, and paybacks as low as 7 years can exceed consumer tolerance. One commenter sees excessive payback periods as offering no incentive for purchasing an ENERGY STAR skylight and leading to the purchase of non-qualified products, which is counterproductive to saving energy.

EPA’s Response: EPA has worked closely with manufacturers to identify revised criteria levels to propose that will address commenters concerns about cost effectiveness for consumers. Based on these conversations, EPA believes the proposed final draft criteria will offer shorter payback periods for consumers. EPA also notes that the guidance in the ENERGY STAR Products Program Strategic Vision and Guiding Principles identifies payback within the lifetime of the product as the program’s cost effectiveness goal.⁴⁵

As noted in Section 2.3, we disagree with EPA’s contention that “payback with the lifetime of the product is the program’s cost effectiveness goal. We are also concerned by EPA’s failure to provide any support for its claim that “the final draft criteria will offer shorter payback periods for consumers.” Without an updated payback analysis, this statement cannot be verified. In fact, the public record casts significant doubt on its validity. All of the stakeholder input on the Draft 2 proposal emphasized EPA’s under-estimation of costs, and many stakeholders provided additional cost information for EPA’s consideration. It thus appears that the result of updated cost-effectiveness and payback analyses that reflected stakeholder input would be longer payback periods.

⁴⁵ Skylight RTC, Comment #17, p. 9

As in the windows section, EPA also claims that its approach on the skylight revisions is consistent with decisions made on other ENERGY STAR products:

Including triple-pane products in the cost effectiveness analysis would be inconsistent with how cost effectiveness is determined for other ENERGY STAR product categories. Manufacturers may choose to offer ENERGY STAR products that are more expensive. However, not all of the costs associated with these products are necessarily related to achieving the ENERGY STAR criteria. Based on EPA's discussions with manufacturers and technical feedback from commenters, EPA believes manufacturers can meet the revised proposed specification using either double- or triple-pane skylights.⁴⁶

As noted in the windows discussion, WDMA does not agree with this claim. Our review of EPA's past revisions of other ENERGY STAR product categories actually confirms that the Agency has previously taken product availability concerns raised by manufacturers very seriously and modified its specifications accordingly.⁴⁷

In addition, WDMA and other stakeholders remain concerned by EPA's subjective decision to exclude triple-pane skylights in its payback analysis. Even more troubling with respect to this omission from the skylight analysis is that we have no idea of the significance of triple-pane in the skylight data set, because EPA has not released any information. Being able to "meet" the specification with double- or triple-pane skylights is different than having sufficient availability of cost effective products, which EPA does not acknowledge in the comment cited above.

The treatment of triple-pane skylights in the cost analysis is important because it directly affects the viability of the specifications proposed for the Northern, North-Central, and South-Central Zones. WDMA has raised significant concerns regarding both the availability and cost-effectiveness of these proposed standards, yet EPA has failed to provide a compelling justification for its assumption that double-pane product will be available in sufficient quantities when the specification goes into effect. In addition, EPA has not made the case that its costs are over-estimated because of additional product features.

Moreover, EPA appears to have already dropped some skylight products from the payback analysis because they have added features. In the recently released paper on the product availability of skylights, for example, EPA said:

EPA did not collect data for operable, impact-resistant, or snow-loaded products because these products have higher price points that are directly related to their enhanced properties rather than energy efficiency, which is the primary focus of this evaluation. Skylights with attached blinds were also excluded for this reason.⁴⁸

Finally, the limited product availability – especially for key subtypes – makes it more likely that triple-pane skylights will be required to ensure product availability. In response to a comment making this

⁴⁶ Skylight RTC, Comment #13, p. 8 -

⁴⁷ See the discussion of EPA's approach on the residential furnaces rule, summarized in Section 2.3 of these - comments. -

⁴⁸ Skylights data, p. 1, footnote 1. -

point, EPA correctly noted that “double-pane skylights meeting the proposed draft specification are currently available for sale on at least one major retailer’s website.”⁴⁹ The availability of a product on a website is not the same as having sufficient quantities of that product to meet consumer needs following an ENERGY STAR revision. EPA needs to explain *how* it concluded that sufficient product will be available when it is needed, and to do so in a manner that enables stakeholders to evaluate the Agency’s decision-making process.

3.4 Issues Related to Transparency

WDMA has several concerns regarding the transparency of EPA’s Final Draft specification. First, as discussed previously in Sections 3.1 and 3.3, EPA has not updated its product availability or payback analyses, despite revising the proposed specifications in the Northern, North-Central, and South-Central Zones. Without such information, stakeholders cannot evaluate the implications of EPA’s proposed specification revisions and ensure that the Agency conducted a proper review and arrived at appropriate conclusions. Beyond that, all we have to go on are EPA’s statements that it believes the proposed revised criteria levels will lead to EPA’s desired outcome, because EPA’s public record for the skylight sector is extremely thin.⁵⁰

Second, EPA has released very little data to support its revised specifications despite repeated stakeholder requests to do so. The Agency explained its position in response to a public comment which observed that EPA’s justification for the skylight cost assumptions were vague and asked EPA to provide additional information. In response, the Agency claimed that they could not release any additional information due to confidentiality concerns.

As noted in Section 3.3, the Agency has provided no support for its claim of confidentiality, nor has EPA attempted to aggregate or mask the data in a manner that would enable its release. Instead, EPA has simply decided that the information provided in the Draft 1 Report is all the detail stakeholders will receive from the Agency.

At the same time, the Final Draft Response to Comments document is full of references to information obtained outside of the public process. EPA’s extensive reliance on such information is a significant concern because none of this information can be reviewed or evaluated by stakeholders. This is why WDMA and other stakeholders have repeatedly requested additional information, which EPA has been reluctant to provide. Consider, for example, the Agency’s response to a public comment submitted on Draft 2 that directly asked EPA to be more transparent “by sharing the details of the calculation methods and assumptions used to derive the inputs to its models instead of providing general philosophical belief statements in responses to comments.”⁵¹ In response, EPA stated:

EPA is unclear on what information the commenter is specifically requesting. EPA invites the commenter or others with specific technical questions to contact EPA directly to discuss specific requests such as this.⁵²

⁴⁹ Skylights, Comment #10, pp. 23-24 -

⁵⁰ Skylight RTC, see for example Comment #7, p. 23. -

⁵¹ Skylight RCT, Comment # 58, p. 19. -

⁵² Op. cit. -

We found EPA's apparent confusion regarding what the stakeholder was requesting quite surprising, because it is common practice when presenting analytical results to explain the underlying data used, methodology, and conclusions of the analysis. Any analyst working in a public process should be prepared to explain what was done and what it means. Ensuring that others can understand and replicate results is a reasonable expectation; it should not be considered a surprise or burden. In this case, however, it appears the Agency doesn't understand that stakeholders will expect data and analytical results to be publicly available when a public process is underway.

Finally, we are concerned that EPA has not thoroughly assessed and responded to data provided through the public comment process. Many public comments on the skylight proposal included additional data for EPA's consideration, but it does not appear that EPA has incorporated this data into its analyses. For example, one commenter provided EPA with specific cost information on the Northern Zone, to which EPA replied with a general statement and no feedback on the stakeholder's data:

Comment (as summarized by EPA): One commenter believes that estimated incremental cost increases were oversimplified and understated. The commenter notes that moving from curb-mount to deck-mount has an incremental cost of \$92 for the proposed Northern Zone criteria. The commenter further notes that curb-mount can be improved for \$48 by adding a second low-e coating, but that is too detrimental to the main function of the skylight. The commenter believes EPA should use the best available information from partners and other trusted sources.

EPA's Response: EPA understands the commenter's concerns about the cost effectiveness and assures commenters that EPA evaluated all available manufacturer cost data when assessing cost effectiveness. If additional manufacturers wish to provide detailed cost data during the current comment period, EPA will review the data to re-evaluate the cost effectiveness analysis provided in the *Draft 1 Criteria and Analysis Report*. EPA has revised the proposed U-factor and SHGC criteria for the Northern Zone to levels that, based on conversations with manufacturers, EPA believes will allow for more curb-mount products to qualify.⁵³

It is difficult to believe that EPA is evaluating "all available manufacturer cost data" when it fails to even acknowledge the data provided by stakeholders through public comment. It is our view that EPA should respond to such comments with specific feedback on the data provided. If it is useful, the Agency should be clear that the data will be integrated into the analysis, and if there is some deficiency, EPA should explain what the problem is. If EPA means what it said in the comment above – that it "will review the data to re-evaluate the cost effectiveness analysis provided" in the Draft 1 Report – then the Agency needs to provide more direct feedback on the information it receives.

3.5 Conclusion

WDMA believes that the Final Draft skylight specification in the Northern and North-Central Zones requires further revision in order to address concerns regarding product availability, cost-effectiveness, and unreasonable payback times. The U-factor in the Northern Zone should be 0.50, and the U-factor in the North-Central Zone should be 0.53. The South-Central U-factor should also be raised, to 0.55, and the SHGC raised to 0.30. We believe a true and accurate cost effectiveness analysis would justify

⁵³ Skylight RTC, Comment #19, p. 10.

these levels, and ensure adequate availability nationwide. Finally we urge EPA to find a better way to balance between confidentiality and transparency – one that protects information that is legitimately confidential while ensuring that stakeholders can evaluate EPA’s work using information in the public record.

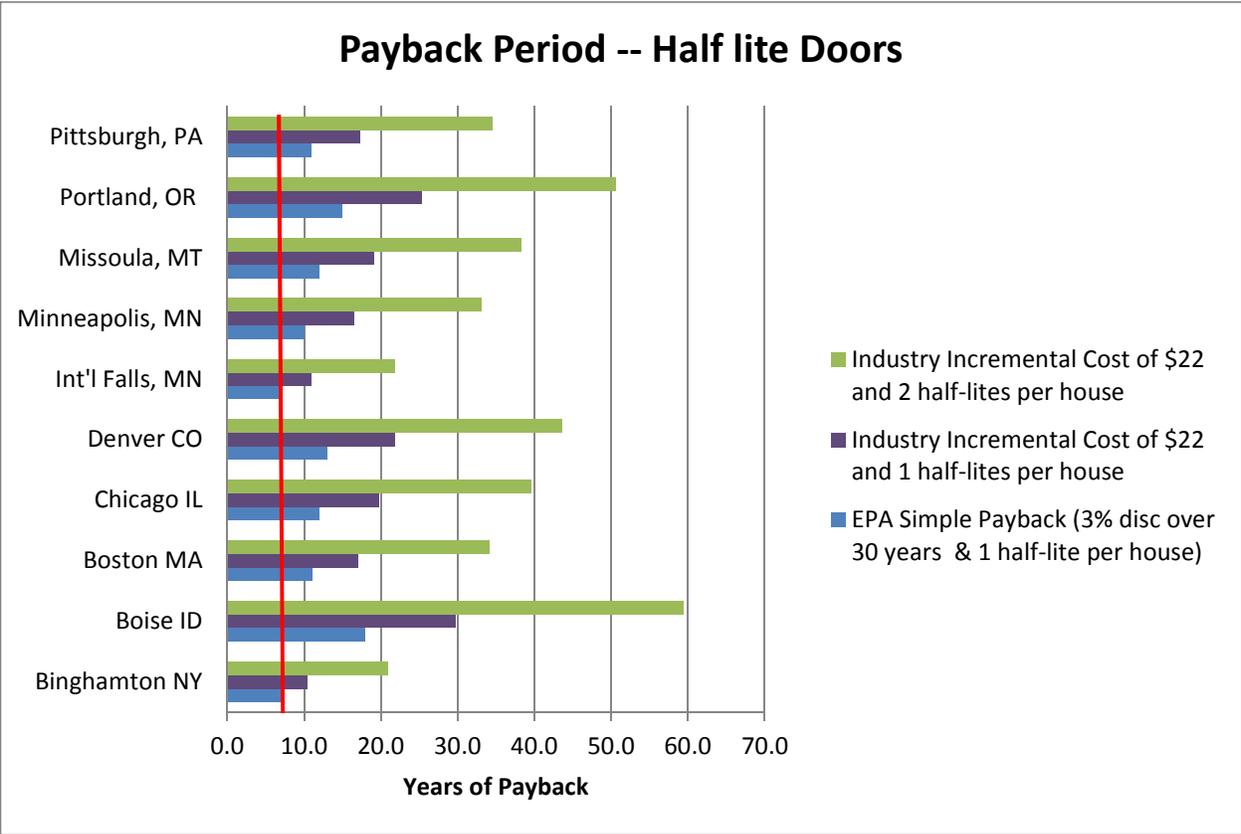
Section 4: WDMA Concerns on the Proposed Doors Specifications

WDMA is also concerned that the July 2013 “Review of Cost Effectiveness Analysis” does not address the comments provided by stakeholders on the revised criteria for doors. In fact, the EPA is apparently giving little weight to the cost analysis for door products. Several manufacturers made comments to Version 6, Draft 1, and again in Draft 2, indicating the changes to criteria for doors offered little-to-no energy savings and in many instances no payback, resulting only in needless cost increases to consumers.

The EPA stated in the Version 6, Draft 1 Analysis Report, that changes to the qualification criteria for opaque doors will offer no energy savings, and energy savings for full-lite doors were rounded down to zero by RESFEN. Based on these facts, the U-factor and SHGC changes proposed by EPA simply reduce the affordability of the product without providing any payback to the consumer. These two points alone render any changes to the ENERGY STAR program for doors unjustifiable.

In addition, EPA indicates there will be minimal incremental cost for half-lite door changes, but analysis by door manufacturers indicates the cost is nearly double the EPA estimate. There should be no change to half-lite doors if there are no associated energy savings that provide a reasonable payback for consumers. For example in Boise, which is a heating dominated climate, the payback period is 18 years by EPA Version 6.0 final estimates, and 60 years by Industry estimates. With little exception, the estimated payback significantly exceeds what is acceptable to consumers in many regions of the country. Please see Figure 7 below which is based on a more reasonable seven year payback period that is demonstrably more acceptable to consumers as discussed in Section 2.3 of these comments regarding our concerns over the lengthy payback periods for windows.

Figure 7: EPA Version 6.0 Final and Industry Payback Comparison for Half-lite Doors (with consumer expected payback of seven years indicated with a red line)



As with windows, we also urge the Agency to redouble its efforts to explain its decisions on doors and reduce its reliance on conversations and data collection activities that occur outside of the public process. This is critical to better and more clearly justifying its decisions regarding the Final Draft door specifications. We further urge the Agency to revisit these decisions based on additional comments submitted by WDMA members in response to the Final Draft.

Section 5: Conclusion

Again, WDMA greatly appreciates the effort the Agency has made to date in developing Version 6.0, and many of the changes that EPA has made in Final Draft. We also greatly appreciate the opportunity to provide these additional comments on the Final Draft.

As we have stated, we understand and respect the challenges the Agency has in revising ENERGY STAR criteria but believe it has an obligation to be sufficiently thorough and transparent when doing so, must uniformly adhere to the Guiding Principles, and be consistent in its decisions. We trust that the additional comments we have provided on the Final Draft expressing our remaining concerns in that regard will be responded to accordingly. To that end, we would welcome the opportunity discuss our comments further with you in person prior to the Agency finalizing the specifications.

We realize that this may add additional time to the schedule, and for that reason we also urge EPA to adjust the Version 6.0 implementation date, if necessary, to provide manufacturers with sufficient time to implement the new specifications. The information we provided in our Draft 2 comments regarding the need for an extended implementation period are still relevant. This approach is consistent with EPA’s earlier decision [in March 2013] to set an implementation date of Jan 2015, had EPA actually completed the specification according to its revised schedule

Please let me know if you have immediate questions on any of the matters raised in our comments. Otherwise we look forward to further dialogue on Version 6.0

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffrey T. Inks". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Jeffrey T. Inks
Vice President, Code and Regulatory Affairs

cc: WDMA Exterior Products Code Committee
WDMA Regulatory Affairs Steering Committee